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October 10, 1956

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Gentlemen:

The work on lithium hydride has now progressed to the point where success appears certain, and I think it is time to put me in touch with your associate who will do the full-scale units.

Lithium hydride has definite advantages over lithium aluminum hydride in this application. There is the weight advantage of 16%. It appears that with lithium hydride an additive to the water in the reaction (I have been using ethylene diamine) will be much less than my initial estimate of 20 lbs. and may not be necessary at all. Finally, lithium hydride is much more convenient and safer to handle. Although a stochiometric mixture of lithium hydride and water is undoubtedly explosive, in the thermodynamic sense I have been unable to produce explosions and have come to consider the amterial as quite safe. This in contrast to lithium aluminum hydride, which does explode when mixed with water.

I had worried about being unabel to dissipate the large heat of the reaction, but now the shoe is on the other foot and I have to conserve heat to make the reaction go fast enough. Contrary to what I had expected, the reaction between the hydride and a large excess of saturated lithium hydroxide solution is readily controlable. The hydride coats over with a nearly impervious film of solid lithium hydroxide, and the thickness of this film regulates the speed.

My invoices for September are enclosed.

Very truly yours,

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